REMARKS

Claims 1-3, 5, and 8-11 have been canceled, and claims 12-31 have been added and remain pending. To facilitate an understanding of the present invention as embodied in the newly submitted claims, the undersigned requests a telephone interview at the Examiner's earliest convenience.

Please note the attached Power of Attorney.

Applicant acknowledges the previous claim rejections in the pending Office Action and will address them in the context of the newly submitted claims. First, a brief summary of each of the new independent claims is provided.

Claim 12 provides an exercise machine in which a mechanical connection transmits a resistive force between a contact member and a source of force, and a support for the mechanical connection changes the direction of a resistive force vector a plurality of times such that an exerciser experiences an oscillating force vector during movement of the contact member through its range of motion.

Claim 18 provides an exercise machine in which a mechanical connection transmits a resistive force between a contact member and a source of force, and an oscillator changes the magnitude of the resistive force a plurality of times such that the exerciser experiences an oscillating magnitude of the resistive force during movement of the contact member through its range of motion.

Claim 25 provides a pulley-based exercise machine in which a cable transmits a resistive force to a contact member via a lead pulley which changes the direction of a resistive force vector a plurality of times such that an exerciser experiences an oscillating force vector during movement of the contact member through its range of motion.

Claims 1-3 were rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Herz (USPN 684,688).

Claims 8-9 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Lambert, Jr. (USPN 4,149,714).

Claims 5 and 8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Herz in view of Williams, et al. (USPN 2004/0014568).

The cited references generally disclose exercise machines that feature "Nautilus-type" cam-

shaped pulleys. Nautilus-type machines feature a cam (shaped like the circumference of a Nautilus swirling sea shell) that provided a transmission to increase or decrease the tensile load in a cable so that the exerciser experiences a more uniform resistance. The varying tensile load adjusts to the body's natural strength curve throughout the entire range of motion, making the movement feel easier in positions where the body is weaker and more difficult where the body is stronger. For example, performing an arm curl with a free weight is more difficult at the beginning than toward the end of the motion because of increased leverage at the elbow as the curl progresses. In contrast, the cam pulley or track line of a Nautilus machine alters the resistance levels so that the force required to begin an arm curl is approximately equal to the force required at the end. If one were to measure the force required to move the cable it would increase from the beginning of the exercise to the end. More importantly with respect to the present invention, there is no oscillation of the force magnitude because the cam-shaped pulley is designed to rotate at most only once, and typically less than one full rotation.

Herz

Therefore, the 1901 Herz patent discloses in column 2, lines 73-81, that "the work consists in turning the crank c' in the direction of the arrow, Fig. 1, so raising the weight e by moving the forearm at the elbow-joint, the radii of cam a' corresponding to the various angular positions of the forearm, are determined empirically, so that the effort always remains the same." In one embodiment (Fig. 6), the cam-shaped pulley "is replaced by a cylindrical drum a^3, in which is cut a helical groove g of varying depth" (col. 2, lines 95-98). So that the cable remains vertical, the shaft a of the cylindrical drum a^3 has a screw thread of the same pitch as the helical groove so that the shaft moves lengthwise while it rotates. This also causes the crank handle C (contact member) to translate along its rotational axis while it turns. This exercise machine, as embodied in Fig. 6, therefore provides a resistance force to turning the crank handle C that varies (increases or decreases) in one direction "so that the effort always remains the same." Moreover, a resistance force vector moves linearly with the rotating crank handle in one direction (i.e., does not oscillate) during the range of motion of the crank handle.

The new claims are distinct from Herz because they all provide either an oscillating resistive force vector (e.g., claim 12) and/or an oscillating magnitude of the resistive force (e.g., claim 18). In this case, "oscillating" means that the property changes sense a plurality of times during the range of

motion of a contact member (sense meaning up and down, or left and right). Claim 25, moreover, provides a lead pulley that changes the direction of a resistive force vector a plurality of times such that an exerciser experiences an oscillating force vector. There is no such lead pulley in Herz.

The citation of Herz is also significant in terms of all of the rejections under 35 U.S.C. §103(a). Herz was a pioneer in the exercise machine art in that he was one of the first if not the first to incorporate cam-shaped pulleys/gears. However, in the 100-plus years since this development, there have been no exercise machines that exhibit oscillating changes in magnitude or direction of resistance force. Instead, there have been countless Nautilus-style machines developed and put on the market. Applicant asserts that this long-felt need is a secondary factor teaching away from obviousness of the present invention.

Lambert, Jr.

Lambert, Jr. discloses a leg press exercise machine that makes use of a Nautilus-style cam-shaped pulley 17. With reference to Figs. 1-3, the operator extends his or her legs forward against the foot pedals 8 (contact member) so as to apply tension in chain 12. The chain passes around a number of gears until it rotates a conventional gear wheel 16 at the upper portion of the device. The gear wheel 16 fixes to a shaft 18 on which is also fixed the cam-shaped pulley 17. The cam-shaped pulley 17 acts through a cable 26 to lift a series of weights 27. The Examiner will note that the cable 26 attaches to the cam-shaped pulley 17 (as opposed to passing over it), and therefore the shaft 18 cannot even rotate the pulley a full revolution and still maintain the cable within its groove. In any event, the shape of the pulley 17 is designed such that the force to initiate a leg press is less than the force at the end of the leg press.

Note in Fig. 1 of Lambert, Jr. the distance between the shaft 18 and the point at which the pulley 17 acts on the cable 26. As the pulley 17 rotates in the direction of the indicated arrow, the point at which it acts on the cable 26 moves farther away from the shaft 18, and therefore the moment arm is greater and the force required to turn the pulley 17 against the force of the weights 27 increases. This is intentional so that the resistance force against movement of the leg press gradually increases as the legs straighten out.

The new claims are distinct from Lambert, Jr. because they all provide either an oscillating

resistive force vector (e.g., claim 12) and/or an oscillating magnitude of the resistive force (e.g., claim 18). In this case, "oscillating" means that the property changes a plurality of times during the range of motion of a contact member. Claim 25, moreover, provides a lead pulley that changes the direction of a resistive force vector a plurality of times such that an exerciser experiences an oscillating force vector. There is no such lead pulley in Lambert, Jr.

Herz and Williams, et al.

Herz has been discussed above.

Williams, et al. disclose a rope climbing exercise machine in which an operator in a seated position "climbs" up or down a beaded chain 18 that passes around upper and lower conventional pulleys 12, 14, respectively. The lower pulley 14 rotates on a shaft 122 that also turns a belt pulley 24 in a transmission ultimately leading to a weight stack 28. There is no mention of varying or oscillating the magnitude of force, and the pulleys 12, 14 are mounted in the same plane and there is no discussion of changing their angular configuration (which would logically introduce wear to the beaded chain).

The Examiner asserts that "Herz teaches the claimed invention except for having the lead pulley tilted." The Examiner cites paragraph [0017] of Williams, et al. to supply the missing element.

Applicant strenuously disagrees a) to the underlying presumption that Herz teaches the claimed invention, b) that Williams teaches a tilted pulley, and c) that there is a *prima facie* case to combine these two entirely disparate references.

The applicability of Herz was discussed above. In particular, Herz does not disclose an oscillating direction or magnitude of a resistive force. This fact by itself undermines the obviousness rejection of Herz in combination with Williams, et al.

Moreover, the passage in Williams, et al. cited by the Examiner does not disclose a pulley tilted from its rotational axis. Instead, the passage in paragraph [0017] is in the context of a system of pulleys in the exercise machine. There are pulleys 12, 14 around which the beaded chain rotates, and there are pulleys 22, 24 around which a resistance belt/cable rotates. It is not clear which of these pulleys is referenced in the last sentence, which reads: "the spacing and/or relative orientation (e.g. angle) of the pulleys may be selectively regulated to further vary rope pull resistance to the user." Applicant asserts that the meaning of "regulating" the relative orientation/angle of the pulleys is not all

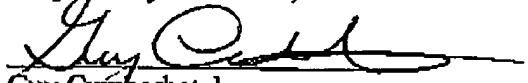
clear, and will certainly does not refer to tilting any of the pulleys. There is no other discussion of tilting the pulleys, and the mechanism appears to be constructed such that any two pulleys connected by a common chain or belt rotate orthogonally about their axes and are aligned in the same plane. Applicant asserts that this passage is at best unclear, and most likely teaches something other than tilted pulleys.

Finally, there is no suggestion to combine Herz with Williams, et al. The Examiner has not made a *prima facie* case that there is any suggestion to combine these two different references into one overall disclosure. In this case, the references have different design goals such that they would not be combined. Herz discloses a crank handle exercise machine that acts on a weight through a transmission including a cam-shaped pulley or gear. The purpose of the cam-shaped pulley is to render more constant the effort expended by the user, and has been explained above. In contrast, Williams, et al. discloses a rope climbing simulator in which there is no need to increase or decrease the resistance to climbing. A user will have the same leverage while climbing throughout the entire range of motion of the weight stack 28. Therefore, there would be no need for changing the level of resistance during a climb.

Based on the above amendments and remarks, Applicant believes that claims 12-31 are in condition for allowance. Again, the undersigned respectfully requests a telephone interview to discuss the new claims.

Date: September 14, 2006

Respectfully submitted,



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